

- 1    1. A power management circuit, comprising:
  - 2       first and second switching elements coupled across first and second rails for
  - 3       energizing a load; and
  - 4              a first power control circuit coupled to the first switching element, wherein the
  - 5       first power control circuit biases the first switching element to a non-conductive state for
  - 6       a portion of a half cycle of an AC signal for energizing the load during which a peak
  - 7       voltage of the AC half cycle occurs when a voltage across the first and second rails is
  - 8       greater than a predetermined threshold.
- 1    2. The circuit according to claim 1, wherein a duration of the first switching element  
2       being in the non-conductive state is centered about the peak voltage of the AC half cycle.
- 1    3. The circuit according to claim 1, wherein the power control circuit includes a  
2       potentiometer coupled across the first and second rails for setting the predetermined  
3       threshold.
- 1    4. The circuit according to claim 3, further including a control switching element  
2       coupled to the potentiometer for biasing the first switching element to the non-conductive  
3       state when a voltage across the potentiometer is greater than a level corresponding to the  
4       predetermined threshold.
- 1    5. The circuit according to claim 4, further including a storage capacitor for biasing the  
2       first switching element to a conductive state.
- 1    6. The circuit according to claim 1, wherein the predetermined threshold is above an  
2       expected peak of the AC half cycle for providing overvoltage protection.

1    7. The circuit according to claim 1, wherein the predetermined threshold is below an  
2    expected peak of the AC half cycle.

1    8. The circuit according to claim 1, further including a control switching element  
2    coupled to the first switching element and a sense resistor coupled between the first rail  
3    and the first switching element such the control switching element biases the first  
4    switching element to the non-conductive state when a current level through the first  
5    switching element is greater than a predetermined current threshold.

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1    9. The circuit according to claim 1, further including a bulk capacitor, wherein the bulk  
2    capacitor is charged to the predetermined voltage threshold.

1    10. The circuit according to claim 1, wherein the first switching element forms part of a  
2    Darlington pair.

1    11. The circuit according to claim 10, wherein the Darlington pair, the load and the  
2    second switching element are coupled end-to-end across the first and second rails.

1    12. The circuit according to claim 11, wherein the load is disposed between the first and  
2    second switching elements.

1    13. The circuit according to claim 10, further including a first diode coupled across the  
2    first switching element and a second diode coupled across the second switching element.

1    14. The circuit according to claim 1, further including referencing voltage levels to a  
2    single rail.

1    15. The circuit according to claim 14, wherein the single rail corresponds to a  
2    conventional black wire terminal and a second white wire terminal is relatively  
3    inaccessible.

1       16. The circuit according to claim 14, further including a high impedance resistor for  
2       coupling to the load to minimize ground fault current.

1       17. The circuit according to claim 1, further including referencing voltage levels to  
2       ground.

1       18. The circuit according to claim 17, further including conventional white and black  
2       input terminals for receiving an AC input signal, wherein the white terminal is adapted  
3       for coupling to the load.

1       19. The circuit according to claim 18, further including a high impedance resistor for  
2       coupling to ground, wherein a potential difference between ground and the white terminal  
3       corresponds to current through the high impedance resistor.

1       20. A circuit having power management, comprising:  
2               first and second switching elements coupled between first and second rails for  
3       energizing a load;  
4               a first power control circuit for controlling a conductive state of the first switching  
5       element;  
6               a second power control circuit for controlling a conductive state of the second  
7       switching element;  
8               wherein the first power control circuit includes a control device coupled between  
9       the first and second rails and connected to a control switching element, such that the  
10      control device biases the control switching element to a conductive state, which biases the  
11      first switching element to a non-conductive state, when a voltage across the first and  
12      second rails is greater than a predetermined threshold defined by the control device.

1       21. The circuit according to claim 20, wherein the first power control circuit includes a  
2       sense resistor coupled to the first switching element for biasing the control switching

3 element to the conductive state then a current through the sense resistor is greater than a  
4 predetermined current threshold.

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1 22. A circuit, comprising:

2 first and second input terminals for receiving an input AC signal;  
3 first and second diodes coupled end-to-end across first and second rails such that  
4 the first input terminal is coupled to a point between the first and second diodes;  
5 a switching circuit including at least one switching element coupled across the  
6 first and second rails via a sense resistor;  
7 a clamp switching element having first, second, and third terminals, the first and  
8 second terminals being coupled across the first and second rails, the first terminal being  
9 coupled to the first switching circuit, and the third terminal being coupled to the sense  
10 resistor, wherein the sense resistor biases the clamp switching element to a conductive  
11 state, which biases the switching circuit to a non-conductive state, when a voltage across  
12 the first and second rails is greater than a predetermined threshold.

1 23. The circuit according to claim 22, further including a capacitor coupled across the  
2 sense resistor for maintaining the clamp switching element in the con-conductive state.

1 24. The circuit according to claim 22, further including third and fourth diodes coupled  
2 end to end across the first and second rails, wherein the load is coupled between the  
3 second terminal and a point between the third and fourth diodes.

1 25. A method of managing power in a circuit, comprising:

2 selecting a voltage threshold at which an AC signal will be clamped such that a  
3 switching element for energizing a load is biased to a non-conductive state during a time  
4 that the AC signal is above the voltage threshold.

1 26. The method according to claim 25, further including centering the time of non-  
2 conduction for the switching element symmetrically about a peak of the AC signal.

1    27. The method according to claim 25, further including charging a storage capacitor to  
2    the voltage threshold level.

1    28. The method according to claim 25, further including generating four current surges  
2    for each cycle of the AC signal.

1    29. The method according to claim 25, further including biasing the switching element  
2    to the non-conductive state when a current through the switching element is greater than a  
3    predetermined current threshold.

1    30. The method according to claim 25, further including selecting the threshold voltage  
2    using a potentiometer.

1    31. The method according to claim 25, further including setting the threshold voltage  
2    above an expected voltage peak of the AC signal to provide overvoltage protection.

1    32. The method according to claim 25, further including modifying the threshold voltage  
2    to provide dimming of a lamp.

1    33. A method of managing power in a circuit, comprising:  
2         providing first and second switching elements across first and second rails for  
3         energizing a load;  
4         coupling a first control circuit to the first switching element and a second control  
5         circuit to the second switching element;  
6         coupling a potentiometer across the first and second rails; and  
7         coupling a control switching element to the potentiometer such that the  
8         potentiometer biases the control switching element to a state that biases the first  
9         switching element to a non-conductive state when a voltage across the first and second  
10      rails is greater than a predetermined threshold selected by the potentiometer.

1       34. The method according to claim 32, further including coupling a sense resistor to the  
2       first switching element and to the control switching element such that the sense resistor  
3       biases the control switching element to the state that biases the first switching element  
4       to the non-conductive state when a current through the sense resistor is greater than a  
5       predetermined current level to provide current surge protection.

1       35. The method according to claim 32, further including selecting the threshold voltage  
2       above an expected peak voltage of an AC signal for energizing the load to provide  
3       overvoltage protection.

1       36. The method according to claim 32, further including centering a time during which  
2       the first switching element is non-conductive about a peak of an AC signal for energizing  
3       the load.

1       37. The method according to claim 32, further including adjusting the voltage threshold  
2       to provide dimming of a lamp.